

REMARKS

The claims have been amended to distinguish over the chemically cleaved microcrystalline fragments obtained by hydrolysis of natural cellulose, disclosed in the journal article titled *The Effect of Microcrystalline Cellulose on the Mixing and Compaction Response of Ferrous Powders*, by L. D. Jones (FMC Corporation) et al.

It is evident that the critical element characterizing the claimed invention is the use of comminuted cellulose fibers. As previously argued, since the microcrystalline cellulose particles described in the reference and the comminuted cellulose fibers, exemplified by natural cotton fibers, used by the applicants, are different, the rejection for anticipation must fail.

As stated in applicants' specification, the cellulose they use is "(iii) fibers of cellulose, exemplified by fibers of natural cotton, the seed hairs from *Gossypium*, having a length in the range from about 1 cm - 2 cm and a diameter in the range from about 5-20 μm , which have been fragmented into micron-sized portions ("micronized") of *fibers having an average length smaller than 70 μm* , preferably smaller than 30 μm ;"

As is evident the term "micronized" was used specifically to identify the comminuted cellulose fibers, exemplified by natural cotton.

Basis for "70" μm in lieu of 150 μm , in claims 1 and 5, is found in claim 7 and in the specification, page 5, lines 5 – 12, the relevant portion of which is set forth above.

Basis for the term "comminuted" is found in the specification, page 4, lines 1 – 3 where it states:

"Moreover, to date, *comminuted cellulose fibers* have been available in an average length no shorter than 70 μm because attempting to comminute them further typically results in forming a fibrous compacted matte."

and, at page 8, lines 14 – 21 where it states:

“It is ***critical that micronized cellulose fibers*** be used. By cellulose fibers we refer to fibers of a predominantly cellulose material such as hemp, jute, cotton, wood, sisal, bamboo, corn stalks and the like which yield individual fibers having a diameter less than about 20 μm . Though any of ***such cellulose fibers may be comminuted*** to an average length less than about 75 μm , they are more easily micronized into fragments in the smaller size range after they are subjected to gamma ray, X-ray or electron beam radiation in an amount sufficient to render the exposed fibers highly frangible, as disclosed in the aforementioned '712 patent the disclosure of which is incorporated by reference thereto as if fully set forth herein.”

The term “comminuted” is used in its ordinary dictionary sense, to wit: To reduce to powder; pulverize; triturate. (see pg. 267, *The American Heritage Dictionary of the English Language, New College Edition*, Editor William Morris, published by Houghton Mifflin Company, Boston 1976).

It is evident that the comminuted cellulose fibers are produced by mechanical means, not by chemical modification.

The appended Declaration of Donald Kubik states what applicants had earlier argued, namely that comminuted (referred to more broadly as “fragmented” in the original claims) cellulose fibers, which are high polymers (as stated in the reference), cannot have been depolymerized by comminution, and depolymerization was the essential step in producing the microcrystalline cellulose disclosed in the Jones et al reference. The Declaration was not presented earlier because this was deemed self-evident, though in retrospect, it is conceded that “fragmented” is a broader term than comminuted, and does not per se, rule out the possibility that the original cellulose molecules were not microcrystalline.

The Declaration of Donald A. Kubik states:

“The authors clearly state that the resulting MCC is microcrystalline depolymerized cellulose. Comminution of cellulose fibers cannot depolymerize them. The comminuted fibers which contain both crystalline and amorphous regions are

distinctly different from depolymerized microcrystalline cellulose which is solely crystalline; and fibers produced by comminution are not produced by a selective chemical interaction such as acid hydrolysis."

This testimony of the witness states his interpretation of the term "comminuted cellulose fibers" (the claim element in dispute), and explains in detail why, as one skilled in the art, he reasonably understands how this claim element is distinguished from the microcrystalline cellulose disclosed in the reference.

This Declaration was not submitted earlier because, in the face of the reference's own statement that natural cellulose fibers were depolymerized and recrystallized to produce the microcrystalline particles (now commercially available) there is no reasonable basis for expecting that depolymerized microcrystalline particles would have substantially the same properties as microscopic parts of cellulose fibers which have not been depolymerized.

The appended Declaration of Barbara Ann Nygaard is provided to confirm that the properties of microcrystalline depolymerized cellulose disclosed in the reference, and exemplified by Lattice NT microcrystalline cellulose commercially available from FMC Corporation, are readily distinguishable from those of comminuted cellulose fibers both by their physical properties, e.g. bulk density, and when substituted, one for the other, and shaken in deionized water and canola oil. These tests were conducted to show that the depolymerized and recrystallized cellulose is readily distinguishable over comminuted cotton fibers.

The foregoing tests were conducted to avoid heating and compressing the powders, which steps would be expected to affect the properties of each in an unpredictable manner.

This Declaration is submitted to buttress the statements made by Donald Kubik which statements reiterate what the reference stated. The basic physical properties measured in the tests described in the appended Exhibits amply confirm that the properties of the microcrystalline cellulose particles and those of the comminuted cotton fibers are different.

Since the microcrystalline cellulose particles and the comminuted cotton fibers are different, the rejection for anticipation must fail.

In view of the foregoing remarks, arguments, and amendments to the claims, it is respectfully submitted that the basis for the rejection has been overcome and that the claims are in condition for allowance.

Respectfully submitted,



Alfred D. Lobo (Reg. No. 24,109)

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